Amendments to the Drawings:

The attached sheets of drawings include changes to Figs. 1(a)-5(b) and Fig. 13. These sheets, which include Figs. 1(a)-5(b) and Fig. 13, replace the original sheets including Figs. 1(a)-5(b) and Fig. 13.

Attachment: 6 Replacement Sheets of Formal Drawings (Figs. 1(a)-5(b) and Fig. 13)

REMARKS/ARGUMENTS

This is a Response to the Office Action mailed March 11, 2005. Claims 1-38 are pending. Claims 26-35 are withdrawn from consideration. Claims 36-38 are cancelled. Claims 1-12, 17 and 18 are rejected. Claims 13-16 and 19-25 are objected to. Claims 1, 3, 7-13, 18 and 19 have been amended. New claim 39 has been added. Figures 1-5 and Fig. 13 have been amended, and 6 sheets of drawings including changes to Figs. 1-5 and Fig. 13 are presented herewith for approval. No new matter has been added to the application. Applicant's attorney has become aware within the last 30 days of a co-pending case (Application No. 10/702,136) by the same inventors, thus Applicants are submitting as an IDS the art cited for the co-pending case. The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Drawings

On page 5 of the Office Action, the Examiner stated that Figures 1-5 should be designated by a legend such as "Prior Art." In response, Applicants are submitting replacement sheets that include changes to Figures 1-5 as requested. In addition, Applicants are submitting a replacement sheet that includes a typographical correction to Figure 13. Applicants respectfully submit that Figures 1-5 and Figure 13, as revised, are in proper form, and request that the objections to the drawings be withdrawn.

Rejections Under 35 U.S.C. § 112

On page 5, the Examiner rejected claim 1 stating that there is insufficient antecedent basis for the recitation "the extension" in line 8. In response, Applicants are replacing the phrase "a first core whose width of the extension becomes gradually narrower" with the phrase "an extension of the first core whose width becomes gradually narrower." The Examiner rejected claim 7 stating that there is insufficient antecedent basis for the limitation "the axis" in line 3. Applicants are amending claim 1 to include the phrase "the first core having a surface region and an axis," thus establishing a proper antecedent basis for claim 7. Finally, the

Examiner rejected claim 19 because of insufficient antecedent basis for the limitation "the extension" in line 2. In response, Applicants are replacing the phrase "the extension" with the phrase "an extension." Applicants submit that no new matter has been added.

Claim Objections

On page 5, with regard to claim 1, the Examiner objected to the phrase "a first core" in line 8. As stated above, Applicants have amended claim 1 by replacing "a first core" with "an extension of the first core." In addition, the Examiner objected to the lack of specificity of the phrase "an extension" in line 4. In response, Applicants are amending claim 1 by replacing the phrase "a second optical waveguide having a second core provided as an extension of the first cladding and a second cladding" with the phrase "a second optical waveguide having a second cladding and a second core, the second core provided as an extension of the first cladding." Finally, the Examiner objected to the limitation that the transition waveguide is "positioned between the first and second optical waveguides," as claimed. Applicants refer the Examiner to Fig. 8 which clearly illustrates a "transition waveguide" positioned between the "first optical waveguide" and the "second optical waveguide." In addition, the specification refers to the transition waveguide as a **region** where the core transitions from a first to a second core and the cladding transitions from a first to a second cladding (Specification, p. 18, line 25 to p. 19, line 1). That is, the transition waveguide is clearly a region between a first optical waveguide comprised of a first core and a first cladding and a second optical waveguide comprised of a second core and a second cladding. Applicants are amending claim 1 by replacing the phrase "a transition waveguide positioned between" with the phrase "a transition region between."

Rejections Under 35 U.S.C. § 102

On page 6, the Examiner rejected claims 1-6 under 35 U.S.C. § 102(b) as being anticipated by *Shani* et al. (hereinafter referred to as "*Shani*"). With regard to claim 1, the Examiner contends that *Shani* discloses a first optical waveguide having a tight mode core

(Si_3N_4) and a cladding (SiO_2:P), and a second optical waveguide having a loose mode core (SiO_2:P) that anticipates the present invention as claimed. Applicants respectively traverse.

> Claim 1 recites, in part,
> … a first cladding covering substantially the whole surface of the first core; a second optical waveguide having a second cladding and a second core, **the second core provided as an extension of the first cladding** (emphasis added).

In contrast, *Shani* does not suggest, teach or disclose a "second core provided as an extension of the first cladding," as claimed. *Shani* discloses a loose mode core (SiO_2:P), a tight mode core (Si_3N_4), and a bottom cladding layer of 15-μm thick SiO_2 (Fig. 1 and page 2389, col. 1, paragraph 2). However, *Shani* does not disclose that the loose mode core is provided as an extension of the SiO_2 bottom cladding layer. In fact, *Shani* discloses that the loose mode core is not an extension of the cladding that substantially covers "the whole surface of the first core," as claimed. *Shani* states "[t]he loose mode core is made of phosphorsilicate glass …" (p. 2389, col. 1, paragraph 2, lines 2-3). In other words, the lose mode core is not an extension of the SiO_2 bottom cladding layer.

In addition, on page 7 the Examiner states that *Nishimura* et al. (U.S. Patent 6,801,692 B2) "has all the structural limitations as claimed by the applicants," and anticipates claims 2-12. Applicants respectfully traverse.

Nishimura et al. discloses a silica optical waveguide 10 having a core 12 and clad 14 (i.e., first cladding), and a silica fiber 20 having a core 22 (i.e., second core) and a clad 24 (Fig. 1, Fig. 2A, and col. 4, lines 5-15). However, as shown in FIGS. 2A and 2B, the core 22 is not an extension of clad 14. In other words, the second core is not provided as an extension of the first cladding, as recited in claim 1. Applicants respectfully submit that *Nishimura* et al. does not suggest, teach or disclose, nor has the Examiner shown, a second core provided as an extension of the first cladding.

Based at least upon the above remarks, Applicants submit that claim 1 as amended is not anticipated by *Shani* or *Nishimura* et al., and request that claim 1 be allowed. In addition, since claims 2-12 depend directly or indirectly from claim 1, Applicants respectfully submit that claims 2-12 are not anticipated by *Shani* or *Nishimura* et al. for at least the same reasons given above in conjunction with claim 1, and request that claims 2-12 be allowed.

Rejections Under 35 U.S.C. § 103

On page 7, the Examiner rejected claims 17 and 18 under 35 U.S.C. § 103(a) as being unpatentable over U.S. PGPub 2003/0053756 to *Lam* et al. (hereinafter referred to as "*Lam*") in view of U.S. Patent 5,157,746 to *Tobita* et al. (hereinafter referred to as "*Tobita*"). Applicants respectfully traverse.

With regard to claim 17, the Examiner states, page 7, that *Lam* discloses (see Fig. 1) "a first waveguide with a first core 4 and cladding 7 ... and a transition waveguide with a tapered core 5." In addition, the Examiner states, page 8, that *Lam* discloses that the transition waveguide with the tapered core 5 is positioned between the first waveguide and a second waveguide (i.e., optical fiber 32, Fig. 7). Furthermore, the Examiner states, page 8, that although *Lam* does not disclose that optical fiber 32 (i.e., the second waveguide) has a core and a cladding, the core and cladding are inherent to the basic functions of an optical fiber, and furthermore, the dashed-line circle in the center of optical fiber 32 (see Fig. 7) indicates "the position of the core."

Claim 17 recites, in part,

> ... the second core covers the first core at least in the part corresponding to the transition waveguide ....

In contrast to the present invention as claimed, *Lam* does not disclose a second core **covering** the first core at least in the part corresponding to the transition waveguide. In fact, regardless of whether the position or size of the core of *Lam*'s optical fiber 32 is indicated by the dashed-line circle enclosing the output facet 33 (Fig. 7) or by the dashed lines drawn within optical fiber 41 (Fig. 8), it is clear that the core of the optical fiber 32 (as illustrated in Fig. 7) or the core of the optical fiber 41 (as illustrated in Fig. 8) does **not** cover at least the part of the first core corresponding to the transition waveguide (i.e., the tapered core 5, Fig. 1). In fact, the core of optical fiber 32 or optical fiber 41 does not cover **any** part of the non-tapering lower waveguide

6 (Fig. 1) or upper waveguide 4 (Fig. 1), let alone the lateral taper portion 5 of the upper waveguide 4.

The Examiner states, page 8, that *Tobita* teaches a method of irradiating light beams onto the surface of a material to change the material's refractive index. However, Applicants submit that the combination of *Tobita* with the primary reference does not remedy the deficiencies of the primary reference.

For at least the above reasons, Applicants respectfully submit that the combination of *Tobita* with *Lam* does not produce the invention as claimed, and request that claim 17 be allowed. Furthermore, since claim 18 depends directly from claim 17, Applicants submit that claim 18 is allowable for at least the same reasons given above in conjunction with claim 17, and request that claim 18 be allowed.

Allowable Subject Matter

Claims 13 and 19 were objected to as being dependent on rejected base claims, but would be allowable if rewritten in independent form including all the limitations of the base claims and any intervening claims. Claims 14-16 were objected to as being directly and indirectly dependent upon the objected to claim 13, but would also be allowable by virtue of being dependent upon the allowable claim 13. Furthermore, claims 20-25 were objected to as being directly and indirectly dependent upon the objected to claim 19, but would also be allowable by virtue of being dependent upon the allowable claim 19. Since claims 13-16 depend indirectly from claim 1, and claims 19-25 depend indirectly from claim 17, Applicants respectfully submit that claims 13-16 are not anticipated by *Shani or Nishimura* et al. for at least the reasons given above in conjunction with claim 1, and claims 19-25 are not obvious over *Lam* in view of *Tobita* for at least the reasons given above in conjunction with claim 17. Applicants request that claims 13-16 and 19-25 be allowed.

In addition, Applicants are rewriting claim 19 as new independent claim 39, including the limitations of base claim 17 and intervening claim 18. Applicants respectfully submit that new claim 39 is in proper form for allowance.

Conclusion

In light of the above amendments and remarks, Applicants respectfully submit that the Application is in condition for allowance. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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DVC:lcs

Enclosures:
Postcard
6 Replacement Sheets of Drawings (Figs. 1-5 and Fig. 13)

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